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FILING DATE.

APPLICATION NUMBER: 60/587,637

FILING DATE: *July 13, 2004*

RELATED PCT APPLICATION NUMBER: PCT/US04/42880



Certified By



Jon W Dudas

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of Commerce for Intellectual Property
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United States Patent and Trademark Office

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APPENDIX A

PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 CFR 1.53 (b)(2)

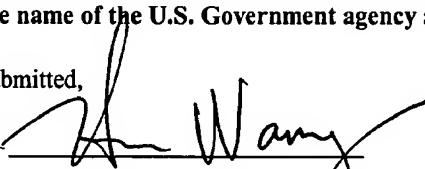
17510 U.S. PTO
60/587637071304
Barcode

INVENTOR(s)/APPLICANT(s)			
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Chokshi	Himanshu	J.	Fremont, California
Hui	Wang		Fremont, California
TITLE OF INVENTION (280 Characters max)			
Two Electrode Chuck for Improving Removal Rate Uniformity During Electropolishing			
CORRESPONDENCE ADDRESS			
ACM Research, Inc, 46520 Fremont Blvd., Suite #610, Fremont, CA 94538			
State	California	Zip Code	94538
Country	USA		
ENCLOSED APPLICATION PARTS (check all that apply)			
[x] Specification		Number of Pages: 2	[x] Application Data Sheet (2pps)
[x] Drawing(s)		Number of Sheets: 5	[] Other (specify)
METHOD OF PAYMENT (CHECK ONE)			
[x] A check or money order is enclosed to cover the Provisional filing fees			PROVISIONAL FILING FEE AMOUNT (\$) 80.00

The Invention was made by an agency of the United States Government or under a contract of an agency of the United States Government.

 No Yes, the name of the U.S. Government agency and the Government contract number are:

Respectfully submitted,

SIGNATURE 

Date July 13, 2004

TYPED or PRINTED NAME Hui Wang

REGISTRATION NO.
(if appropriate) Additional inventors are being named on separately numbered sheets attached hereto.
PROVISIONAL APPLICATION FILING ONLYExpress Mail Label Number: _____
Date of Deposit: July 13, 2004

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Office to Address" service under 37CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

Date: _____ By: _____

TWO-ELECTRODE CHUCK FOR IMPROVING REMOVAL RATE UNIFORMITY DURING ELECTROPOLISHING

Two-electrode chuck is an apparatus for holding semiconductor workpieces (wafers) during electropolishing process. It provides electrical power to the wafer through two different paths as well as vacuum and gas (nitrogen, air, etc.) necessary for the chuck functioning. For detail operation mechanism, please see US patent application ser.No. 60/332. 417, entitled ELECTROPOLISHING ASSEMBLY, filed on November 13, 2001; No. 60/372, 567, entitled METHOD AND APPARATUS FOR ELETROPOOLISHING METAL FILM ON SUBSTRATE, filed on April 14, 2002; and PCT patent application No. PCT/US 02/36567, entitled ELETROPOOLISHING ASSEMBLY AND METHOD FOR ELETROPOOLISHING CONDUCTIVE LAYERS, filed on November 13, 2002, all of which are incorporated herein by reference in their entirety.

Fig. 1 shows exploded view of two-electrode chuck assembly including major subassemblies.

Fig. 2 shows exploded view of two-electrode chuck shaft.

Fig. 3 shows exploded view of two-electrode chuck top assembly.

Fig. 4 shows exploded view of two-electrode chuck bottom assembly.

Fig. 5 shows section view of two-electrode chuck bottom assembly.

With reference to Fig. 1 two-electrode chuck assembly includes shaft assembly 101, top assembly 102, bottom assembly 103, rotary union 104, electrical contact assembly 105 with upper 111 and lower 112 contact, pins 106, and compression springs 107.

Shaft 101 and rotary union 104 support chuck spinning during process. They also supply spinning chuck with vacuum to hold and seal wafer and compressed gas to help remove wafer after process finished. Electrical contact assembly 105 provides spinning chuck with electrical power from two independent sources. Chuck top assembly 102 and chuck bottom assembly 103 connected together with two or more pins 106 and compression springs 107. Chuck can be open to load wafer and then closed to hold it and seal edge of the wafer during process.

With reference to Fig. 2 shaft assembly includes shaft 201, upper contact ring 202, lower contact ring 203, lower contact ring insulator 204, contact pin 205, contact pin insulator 206, contact rod 207, contact rod insulator 208, contact rod holder 209, spring contact 210.

Inventors: Felix Gutman, Himanshu J. Chokshi, Mark Jacobus Van Kerkwyk, , Hui Wang
Date: July 13, 2004

With reference to Fig. 3 top assembly includes block 301, to or more vacuum and gas channels 302, contact screw 303, contact screw insulator 304, contact nut 305, contact nut insulator 306, wire 307, wire insulator 308, clamps 309, cover 310, top plate 311, top plate inserts 312, metal plate 313, bottom plate 314, and two or more leaf spring contacts 315.

With reference to Fig. 4 bottom assembly includes bottom ring 401, outer gasket 402 which tighten to the bottom ring with clamp ring 403, inner ring 404 which tighten to the bottom ring with wafer centering ring 405, screw insulators 406 and plugs 407 to insulate the centering ring from bottom ring, cones 408 to direct wafer, and wafer contact spring 409.

With reference to Fig. 5 in addition to items listed above shown insulating layer 501 on top surface of bottom ring, screws 502, and spring wire 503 that keeps wafer contact spring 409 in place.

Electrical power (potential) to the chuck can be provided through two independent circuits (paths). The first path includes with reference to Fig. 1 lower contact 112 of electrical contact assembly 105, with reference to Fig. 2 lower contact ring 203, shaft 201, with reference to Fig. 3 block 301, metal plate 313, leaf spring contacts 315, with reference to Fig. 4 wafer centering ring 405, and wafer contact spring 409.

The second path includes with reference to Fig. 1 upper contact 112 of electrical contact assembly 105, with reference to Fig. 2 upper contact ring 202, contact pin 205, contact rod 207, spring contact 210, with reference to Fig. 3 contact screw 303, contact nut 305, wire 307, top plate inserts 312, with reference to Fig. 1 compression springs 107, pins 106, and with reference to Fig. 4 bottom ring 401.

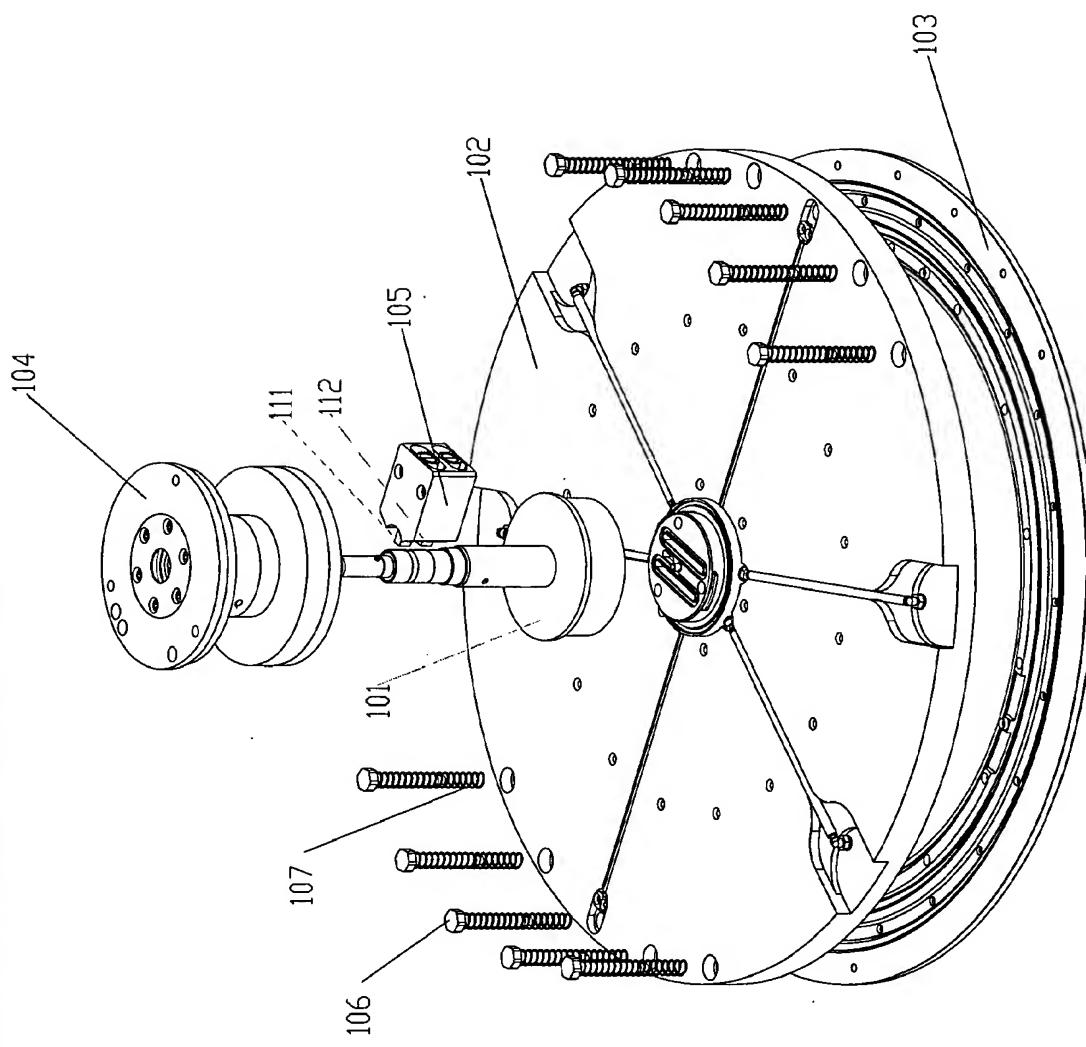


FIG. 1

Title: Two Electrode Chuck for Improving Removal Rate Uniformity During Electropolishing
Inventors: Felix Gutman, Himanshu J. Chokshi, Mark Jacobus Van Kerkwyk, , Hui Wang
Date: July 13, 2004

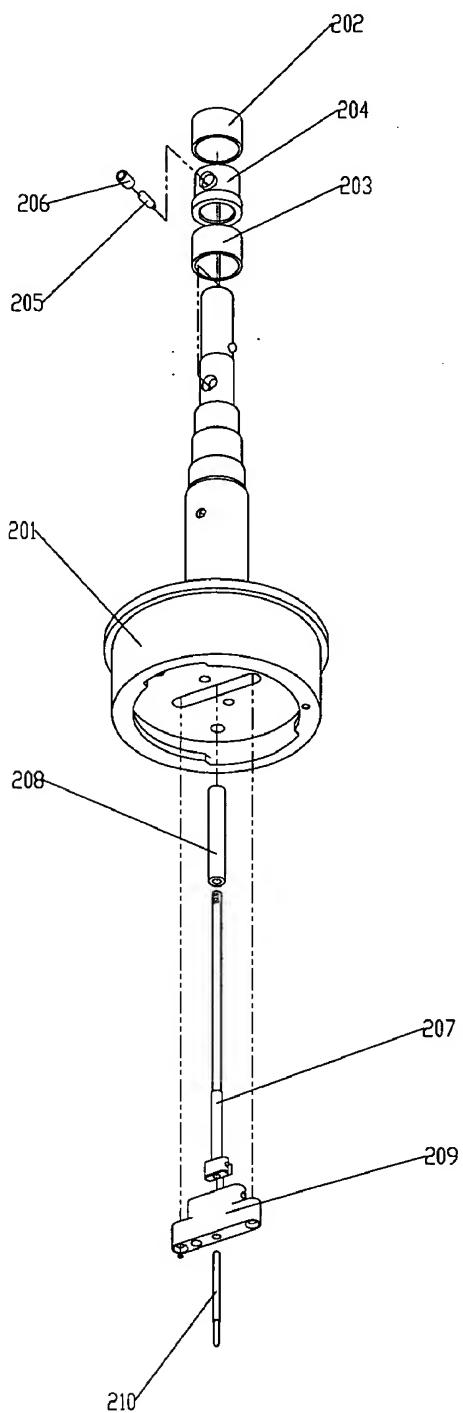


FIG. 2

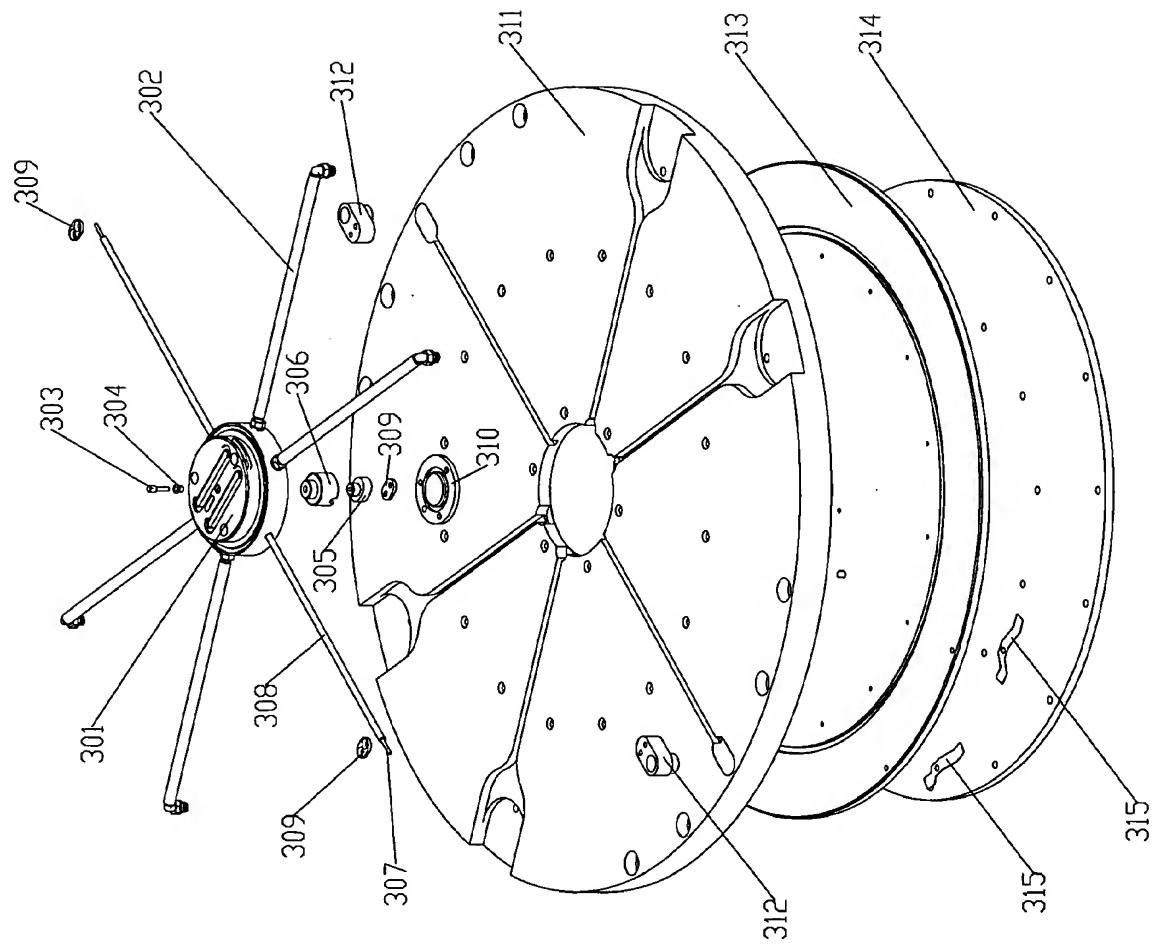


FIG. 3

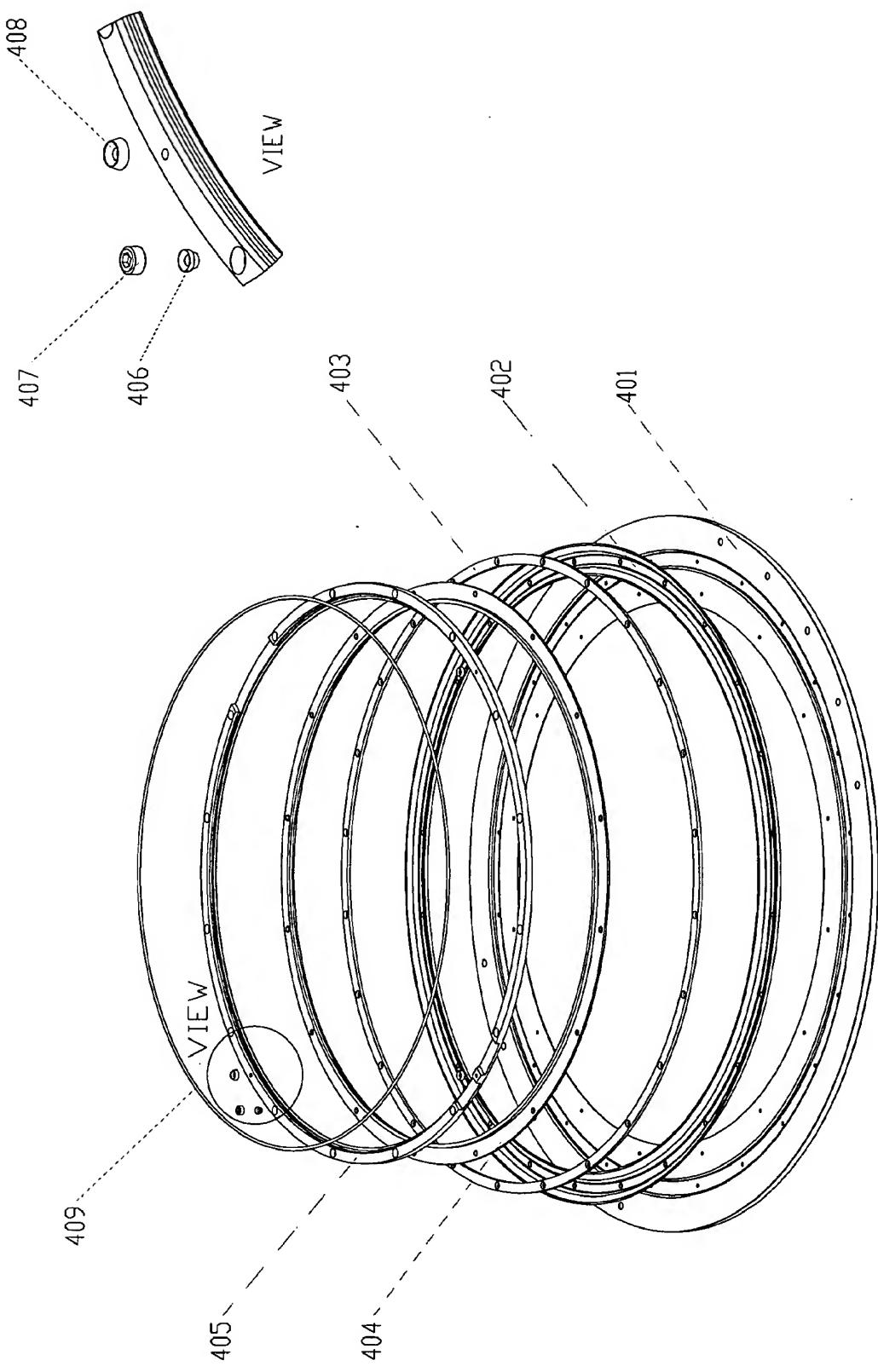


FIG. 4

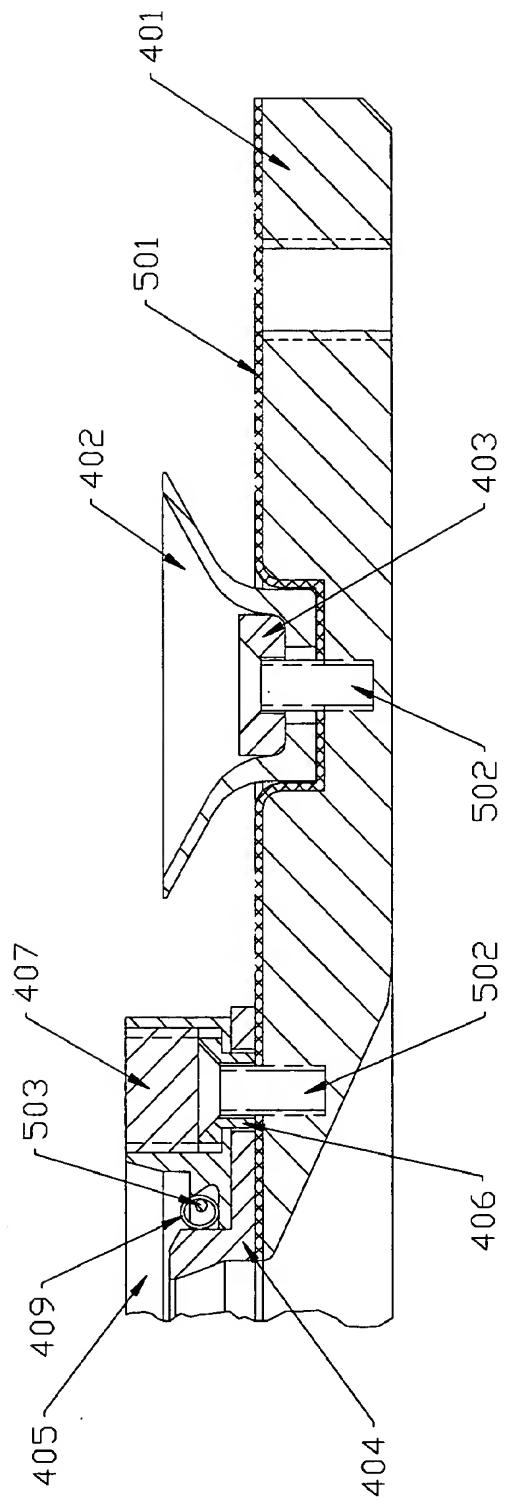


Fig. 5

Application Data Sheet

Application Information

Application Type:	Provisional
Subject Matter	Utility
Suggested Classification:	
Suggested Group Art Unit:	
CD-ROM or CD-R?:	
Number of CD disks	
Number of copies of CDs:	
Sequence submission?:	
Computer Readable Form (CRT)?:	
Number of copies of CRF:	
Title:	Two-Electrode Chuck for Improving Removal Rate Uniformity during Electro-polishing

Attorney Docket Number:

Request of Early Publication?:

Request for Non-Publication?:

Suggested Drawing Figure:

Total Drawing Sheets:

5

Small Entity:

Yes

Petition included?:

Petition Type:

Applicant Information

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Domestic Priority Information

Application:	Continuity Type:	Parent Application	Parent Filing Date:

Foreign Priority Information

Country:	Application Number:	Filing Date:	Priority Claimed

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